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Waste Action Plan Consultation
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20th February 2020

RE: Consultation – Waste Action Plan for a Circular Economy

To whom it may concern,

Irish Water welcomes the consultation on the development of a new Waste Action Plan for Ireland as part of the transition to a Circular Economy.

In the coming years Irish Water will invest nearly €5billion in the continued improvement of our water and wastewater services. This investment will ensure the delivery of secure and sustainable water and wastewater services, essential for health, our communities, the economy and the environment. Irish Water has over 7,000 assets nationwide both in relation to abstraction for drinking water production and to discharges from waste water treatment plants.

Irish water welcomes a new Waste Action Plan and strong policy tools to deliver on measures and actions supporting circularity and sustainability.

Circularity and bio-economy initiatives have significant potential in supporting GHG emission reductions. Reducing, reusing and recycling avoid GHG emissions, more significantly, circularity reduces GHG emissions through avoiding the energy required to convert raw materials into products. To date, the mitigation potential of these initiatives have based largely on a traditional sector based approach and as such has not captured the full emissions reduction potential. A holistic and lifecycle approach is required, that looks at the entire manufacturing chain from cradle to grave. A holistic approach fosters collaboration between industries, whereby a waste/by-product from one industry could be used as a raw material for another industry. In the context of public sector bodies, co-operation and synergies between different organisations offer significant potential for the development, implementation and commercialisation of novel and beneficial innovations in the bio-economy sector.

The transposition and interpretation of regulations facilitating circularity, innovation and bio-economy initiatives varies between European countries, most notably, in evolving scientific research to field scale pilot testing and further development of successful pilots into mainstream operations.

For example, no exemption or mechanism exists for field trials/circularity pilots i.e under current legislation any volume greater than 1 tonne for pilot trial triggers waste management regulations, 1 tonne is useful for laboratory scale research. Brick Manufacturer – no mechanism to conduct trial with volume without the manufacturer being required to hold relevant waste permit. Sludge Treatment Reed Beds (STRB's) – No exemptions exists for low carbon and natured-based sludge treatment solutions, (T20 Exemption exists in UK).

Irish Water would welcome the transposition in Irish Legislation practical exemptions that would facilitate circularity and sustainability, particularly with regard to;

- Use of a waste for specified purpose e.g U8 Exemption, Use of alum/ferric sludge (190902) for nutrient removal in WWTP, – displacing the requirement for manufactured chemicals
- Use of alum/ferric sludge (190902) for nutrient removal in Integrated Constructed Wetlands, a low carbon and nature-based sludge treatment solution
- Sludge Hubs and recovery of waste that requires further treatment at a WWTP- e.g T21 exemption
- Storage of diggings from leaks and repairs at water treatment assets
- Requirement for waste licensing of direct labour in fixing leaks and repairs

Appendix A of this letter contains an expansion on some of the above points and concepts including opportunities that exists in the water sector through harnessing wastewater and sludge as a resource/raw material, particularly in the context of circularity and sustainability.

Irish Water welcomes any discussion on any of the points raised in this letter.

Yours sincerely,

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Gerry Galvin
Chief Technical Advisor

Appendix A - Irish Water working examples for Waste Action Plan Consultation

1. Saleen WWTP

Irish Water plan to construct an Integrated Constructed Wetlands (ICW) with a capacity to treat a population of 1000 persons at Saleen in East Cork. The development consists of constructing 5 No ponds or cells through which wastewater is discharged totalling 3 hectares in area. Each of the cells will be planted with natural wetland vegetation and will provide a high level of treatment for wastewater.

As part of development IW had initially hoped to incorporate Alum Sludge in the construction of the Wetland. This would confer a number of benefits

1. It significantly enhances removal of Phosphorous from treated effluent. This assertion is based primarily on EPA research outputs "Environmental Technology: Development of an Alum Sludge-Based Constructed Wetland System for Improving Organic Matter and Nutrients Removal in High-Strength Wastewater" and subsequent research in both UCD and elsewhere including small scale pilot trials.
2. Use of sludge which contains a high level of fine material when mixed with excavated material significantly enhance the impermeability of the pond base. This could avoid the need for a synthetic liner and/or the import of suitable fill material from a primary source elsewhere.
3. ICW's ultimately become carbon sinks. Limited data is available on sequestration capacity but figures of up to 3 tonne/ha/annum have been mooted. In addition habitat enhancement arises and social amenity is developed (walking/running track around site perimeter). They also require minimal electricity input as compared with conventional treatment.
4. Use of imported sludge has the potential to save significant cost through diversion of sludge disposal to landfill, significantly reducing carbon footprint - sludge from Iniscarra in Cork was disposed of in Cavan; and freeing up funds to address problems elsewhere.
5. We are incorporating significant monitoring capacity in design layout which will enhance knowledge of performance of ICW's including impacts of sludge if used.

Barriers

1. Stockpiling of sludge over 6 months requires a waste licence. Whereas volumes of sludge required are uncertain, it will be in excess of 700m^3. As the works will be carried out by contract a stockpile would be required. As such we would have to get a permit to store waste at one or more of our Water Treatment Plants.
2. If we utilise sludge at ICW; the site will require a waste permit.
3. No T20 waste exemption similar to UK - **Treating waste at a water treatment works** - https://www.gov.uk/guidance/waste-exemption-t20-treating-waste-at-a-water-treatment-works
4. No exemption or mechanism for field trials/circular economy pilots i.e. under current legislation any volume greater than 1 tonne for R&D/pilot trials triggers the full waste management regulations – e.g. Brick Manufacturer – no mechanism to conduct trial with volume without the manufacturer being required to hold relevant waste permit.
5. 1 tonne is only useful for lab research.
6. Cert of Registration (COR) process is cumbersome and time consuming – need a streamlined system.

2. Wastewater sludge

Land re-use of wastewater/sewage sludge:

- At present virtually all Irish Water wastewater sludge is spread, following appropriate treatment, on land. This recycles nutrients and replaces artificial fertilisers.

Barriers

- The use on food crops is regulated under the Use of Sewage Sludge in Agriculture Regulations, which sets out the requirements and obviates the need for a waste licence.
- However use on non-food crops (e.g. energy crops, biomass) is not covered under these regulations, but instead requires permitting under waste regulations.
- These regulations add to the complexity and cost of use of sludge on non-food crops.

This is summarised in the first item in a previous list of "legislative issues" (draft):

Area	Issue	Impact	What are we planning/proposing?
Sludge	Legislation in relation to use in energy crops restricting use	• Energy crops unlikely to provide a future outlet due to administrative costs (individual CORs)	• Energy crops to be considered in Sewage Sludge in Agriculture Regulations or treated biosolids recognised as a product

3. Application of Alum/Ferric Sludge Treatment Reed Beds (STRB) in IW's asset base

- Disposal of waste sludge is becoming increasingly challenging due to closure of landfills, restrictions on what they can accept, and limited reuse opportunities. This is particularly the case in rural areas and for smaller plants. Solutions are being progressed for larger plants where economies of scale allow for installation of high-end mechanical solutions. Quality control enables a consistent product to be produced, that may subsequently be beneficially used in industry e.g. (cement production). However there are limited outlets and subject to economic evaluation which will be enabled by trials, treatment of sludge from larger plants in reed beds may be a more attractive economic proposition, particularly where we have lands available. Sludge treatment reed beds (STRB) have been used for dewatering (draining and evapotranspiration) and mineralization of wastewater in Europe since 1986, namely, in Denmark, Poland and Germany and more recently the UK for Ferric drinking water sludge.
- Utilisation of STRB's for treatment of Alum Sludge is a relatively new departure. To date small scale trailing has been carried out by Northumbrian Water. IW would like develop on these trials to a stage where a working solution could be rolled out at suitable locations.
- Long-term sludge reduction takes place in reed planted basins, partly due to dewatering (draining and evapotranspiration) and partly due to mineralization of the organic solids in the sludge.
- STRBs allow for low capex and opex whilst providing the asset with an environmentally friendly operation area and have strong ecological and environmental credentials, providing significant reductions in carbon footprint/greenhouse gasses associated with reduced tankering and sludge processing.
- New sustainable long term solutions are required to address IW's water treatment plant (WTP) sludge management. The adoption of new processes and technologies forms part of IWs goal to reduce carbon emissions in line with National and International climate change goals.
- Sludge generation has and will continue increasing in line with more organic carbon removal (particular with regards THMs). Rationalisation of existing dispersed sources over time will lead to an increase of circa 15% in volume of sludge produced over coming years.

STRBs offer the following potential benefits to IW:

- Holistic approach to Alum Sludge management and resource recovery at source;
- Contributes to IW Energy Efficiency targets and Carbon-reduction objectives;

- Supports Sustainable Development Goals (SDGs);
- Reduces Opex and operational complexity; and
- May through creating of scale, support resource recovery initiatives at a future date.

Barriers

1. If we consider installing Alum/Ferric STRBs; the site will require a waste permit.
2. No T20 waste exemption similar to UK - **Treating waste at a water treatment works** - https://www.gov.uk/guidance/waste-exemption-t20-treating-waste-at-a-water-treatment-works
3. No exemption or mechanism for field trials/circular economy pilots i.e. under current legislation any volume greater than 1 tonne for R&D/pilot trials triggers the full waste management regulations – e.g. Brick Manufacturer – no mechanism to conduct trial with volume without the manufacturer being required to hold relevant waste permit.
4. 1 tonne is only useful for lab research.

Irish Water would welcome the opportunity to collaborate with other stakeholders on the development of regulatory framework with the EPA and other relevant authorities supportive of innovative and circular economy processes. Opportunities exists in the water sector through harnessing wastewater and sludge as a resource/raw material, as detailed below;

- Fertilisers - Nitrogen/Phosphorous substitute for manufactured fertilisers through direct extraction or incorporation in algae followed by appropriate downstream processing which may include energy extraction. It should be noted that industrial nitrogen manufacturing consumes 1-2% of global energy supply, whilst peak Phosphorous is predicted to occur c. 2035.
- Energy - utilising existing infrastructure co-digestion and opportunistic effluent for irrigation growth medium and treated sludge as a soil enhancer.
- Recovery and management of Fats Oils and Greases (FOG's) and use for energy generation.
- Biomass production such as high rate aerobic algal ponds, macrophytes and biomass crops with significantly increased yields.
- Feedstock-utilisation of sewage as a biological feedstock-bioplastics (PHA's), alginates, alcohols and inorganics and land reclamation leading to increased yields/not taking lands from food production.
- Algae as an animal feedstock.
- Removal of barriers to the development of worthwhile initiatives, thus increasing potential supply base, product development and ultimately development of the market for such products. Examples in water industry are recovery/struvite/alginate/Aqua Minerals (lime pellets/sludge, aquafer (GW), iron pellets, filters gravel, carbon sludge, struvite, humic acids.
- Avoidance of value fragmentation arising from mono-tech approaches, focus on integrated solutions to address national targets for carbon reduction.
- Incentives based on Carbon substitution values.
- Future Ireland Inc. requirements to limit carbon – potential applications for energy recovery from advanced anaerobic digestion.